MIDLANDS CENTRE
For Data-Driven Metrology

Topic: Fibre optic sensing for in-process manufacturing measurements in harsh environments
Location: Loughborough University

In this project, the student will develop and model the performance of a prototype fibre optic sensor for deployment as an on-machine sensor in a range of manufacturing applications. On-machine metrology is a growing requirement for many high-value manufacturing processes, to ensure tolerances of complex geometric parts are adhered to and for process control. This project will focus on the implementation of very compact distance sensors in the machining environment. This is difficult due to the hostile operating conditions. However, low coherence interferometry is a proven measurement technique that has shown promise for operating in challenging environments, with a small footprint due to straight forward integration into fibre optic systems. This project will investigate how best to deploy the sensors, understand the performance of the sensor, and process the acquired data, such that useful and reliable information can be extracted.

The project will be supervised by Dr Peter Kinnell Dr Laura Justham and Dr Jon Petzing, from the Wolfson School of Mechanical Electrical and Manufacturing Engineering at Loughborough University.

The position is available for UK candidates, but EU or International applicants who can pay the difference between the Home and International Fees would also be welcome to apply. Candidates must possess or expect to obtain, a high 2:1 or 1st class degree in a related science or engineering discipline.

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Supervisor: Dr Laura Justham

Laura is currently a Senior Lecturer at Loughborough University and a member of the Intelligent Automation Centre at Loughborough University. She is the lead academic for the advanced manufacturing processes within the Centre. Throughout her academic career, her research focus has been on the development of advanced manufacturing processes which has focused on novel system integration; developing individual components and integrating them together with machine vision, computer control and instrumentation to develop superior systems.

Supervisor: Dr Jon Petzing

Jon is a Senior Lecturer in Metrology with expertise in the fields of engineering metrology and biometrology. He has invented metrology theory and systems, developed standards, defined industrial applications, and worked with multiple National Measurement Institutes around the world. He was a member of the UK National Measurement Office Engineering & Flow, and is now a member of the BSI BTI/1 Biotechnology Committee, advising on metrology for biomanufacturing standards development.

Supervisor: Dr Peter Kinnell

Is a Reader in Metrology and held an EPSRC Manufacturing Fellowship in Collaborative Metrology for High Value Manufacturing. He is the assoc. Director of the Intelligent Automation Centre at Loughborough University where he leads the research team working on 3D vision for robust intelligent measurement. He is currently working on the creation of new sensing technology, new algorithms for advanced data processing, and implementing measurement systems within automation and manufacturing systems.